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(56) Documents cited
US 4827423 A US 4149246 A

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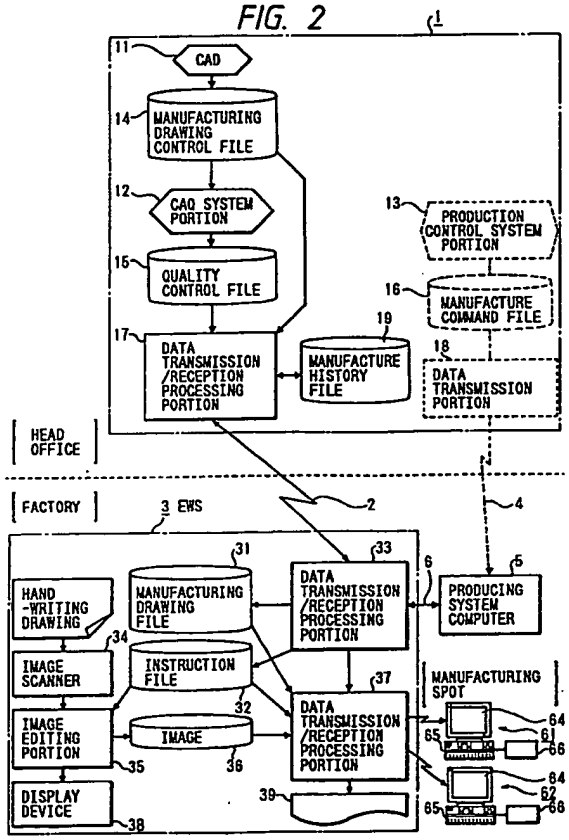
(54) Production control information processing system

(57) Manufacturing drawing information formed in a computer aided system 11, a quality control instruction table based on the manufacturing drawing information, and the order amount, the date of delivery, and the like are entered in a production control system portion 13. Then, the information is transmitted to an engineering work station (EWS) 3 in a factory. In the EWS a handwritten process instruction such as "factory know how" is read in, 34-36, as image data; and the quality control instruction table, a manufacture instruction table, and a process instruction table are integrated, 37, to form a work instruction table. The work instruction table is sent to interactive type terminals 61 and 62 provided at manufacturing locations and is displayed there in synchronism with the producing process. The manufacture history is stored in a file 19 of the main information processing apparatus through the EWS 3.

FIG. 2



GB 2 259 168 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

FIG. 1

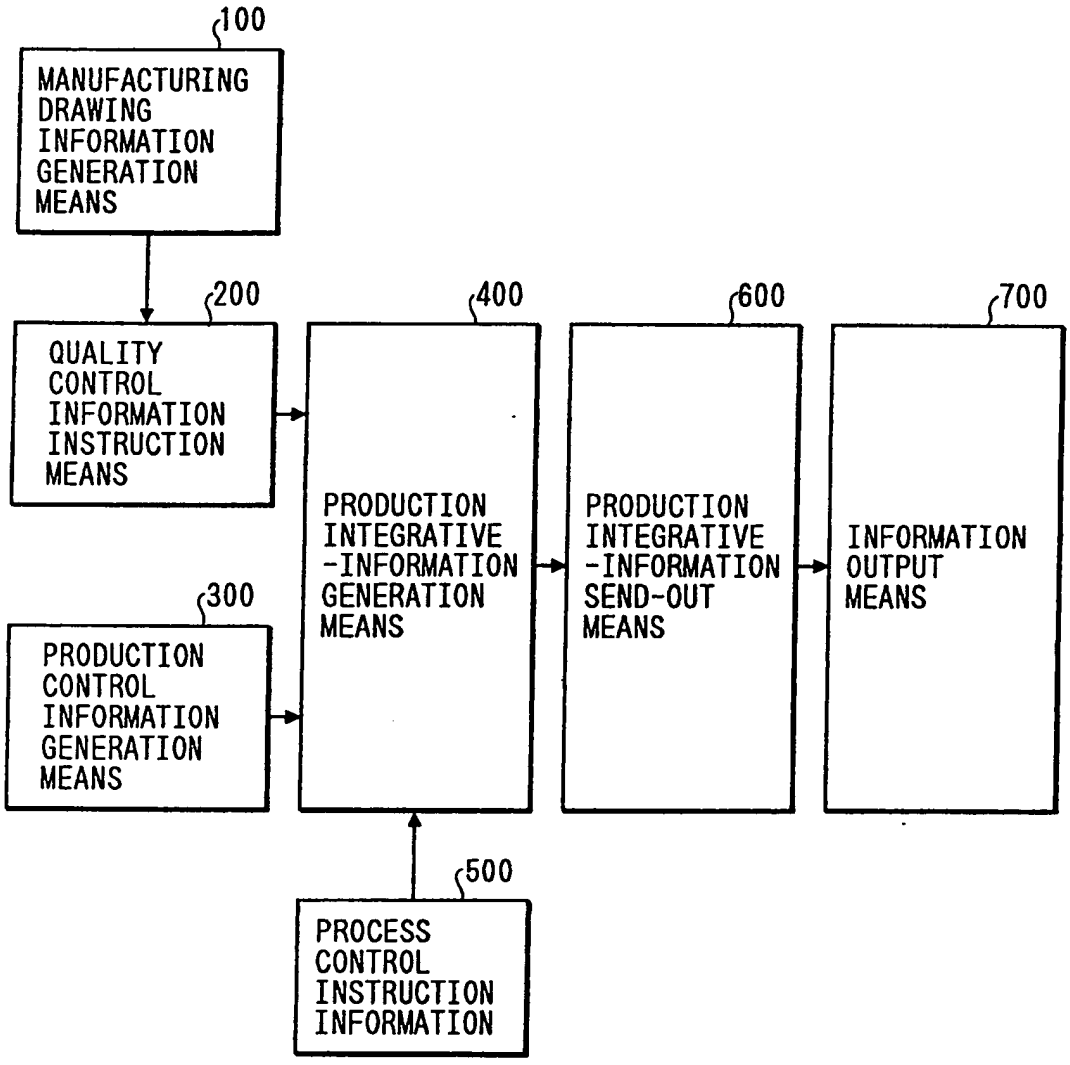

100
MANUFACTURING DRAWING INFORMATION GENERATION MEANS
200
QUALITY CONTROL INFORMATION INSTRUCTION MEANS
300
PRODUCTION CONTROL INFORMATION GENERATION MEANS
400
PRODUCTION INTEGRATIVE -INFORMATION GENERATION MEANS
500
PROCESS CONTROL INSTRUCTION INFORMATION
600
PRODUCTION INTEGRATIVE -INFORMATION SEND-OUT MEANS
700
INFORMATION OUTPUT MEANS

FIG. 2

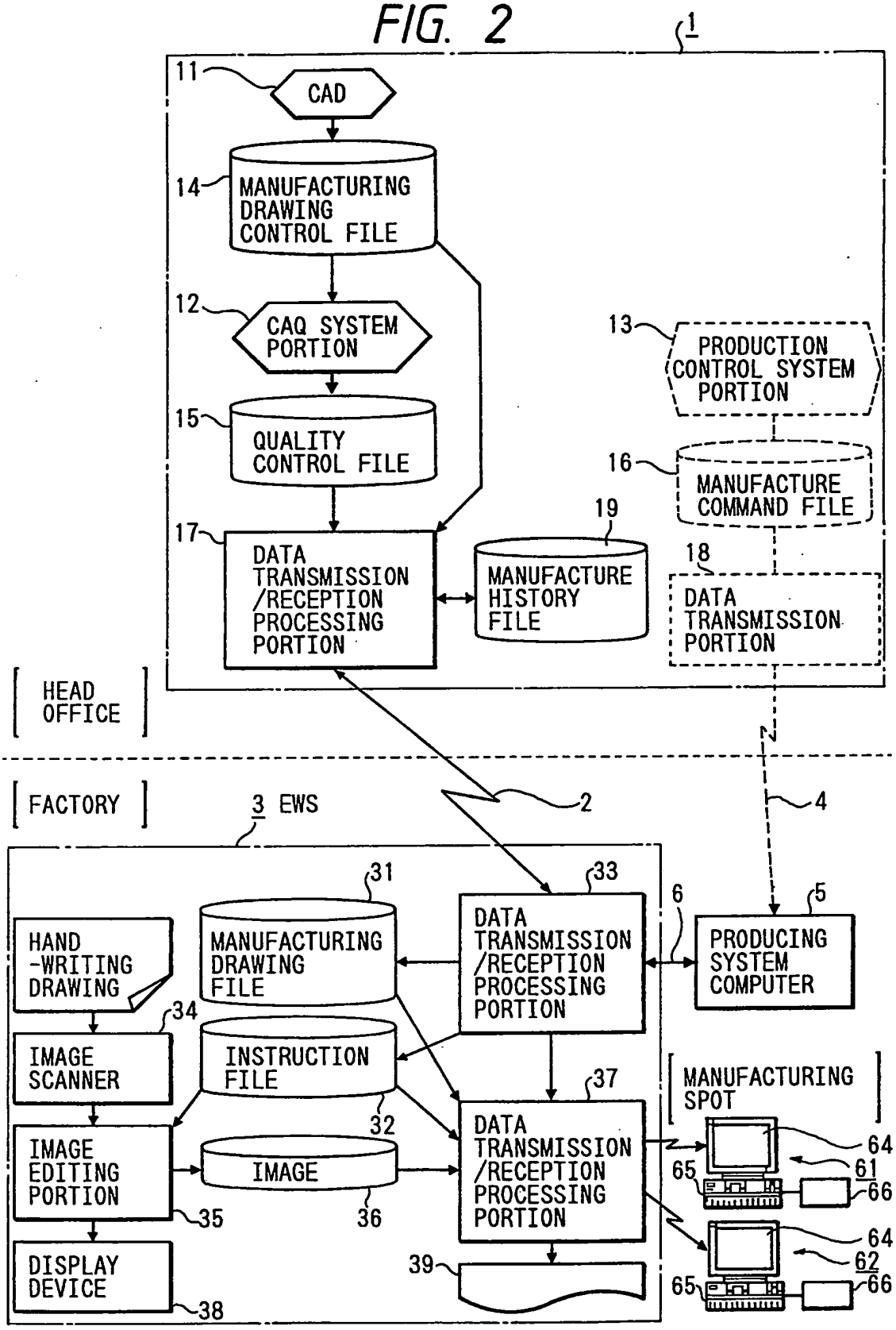

1
11
CAD
14
MANUFACTURING DRAWING CONTROL FILE
12
CAQ SYSTEM PORTION
15
QUALITY CONTROL FILE
17
DATA TRANSMISSION /RECEPTION PROCESSING PORTION
19
MANUFACTURE HISTORY FILE
13
PRODUCTION CONTROL SYSTEM PORTION
16
MANUFACTURE COMMAND FILE
18
DATA TRANSMISSION PORTION
HEAD OFFICE
FACTORY
3 EWS
2
4
31
33
6
5
HAND -WRITING DRAWING
MANUFACTURING DRAWING FILE
DATA TRANSMISSION /RECEPTION PROCESSING PORTION
PRODUCING SYSTEM COMPUTER
34
IMAGE SCANNER
INSTRUCTION FILE
37
MANUFACTURING SPOT
32
IMAGE EDITING PORTION
IMAGE
DATA TRANSMISSION /RECEPTION PROCESSING PORTION
64
65
61
66
35
36
64
62
65
66
DISPLAY DEVICE
39
38

FIG. 3

QUALITY CONTROL INSTRUCTION TABLE
71

CONTROL ITEMS	PROCESS STANDARDS
NUMBER OF ACCOMODATED	77
NUMBER OF BOXES	40
AMOUNT PER PALLET	3080
DIVISION OF PALLET	○ ○ ○
MARKING (A)	HR30307C
MARKING (B)	——
RUSTPREVENTION OIL	NO UNEVENNESS
QUANTITY OF OIL INSIDE A TANK	NOT SMALLER THAN 1/2
TRAY AND GOODS DELIVERY BOX	NO WATER AND NO FOREIGN MATTER

INSPECTION PROCESS INSTRUCTION TABLE	NO.
B BODY INSPECTION	BTK10101
ASSEMBLY	ASS10101
COMPLETION INSPECTION	BKK10101
COMPLETION INSPECTION 1	AK110101
COMPLETION INSPECTION 2	AK210101

FIG. 4

MANUFACTURING INSTRUCTION TABLE
72

NUMBER OF PRODUCTS	4620	NUMBER OF PALLET	1	NUMBER OF BOXES	60	NUMBER OF PRODUCTS PER BOX	77
DATE OF INSPECTION	03-29	END NUMBER	1	END NUMBER			
DATE OF DELIVERY	04-25						
INSPECTION ROD NUMBER	NO. A101 903096						
NAME NUMBER							

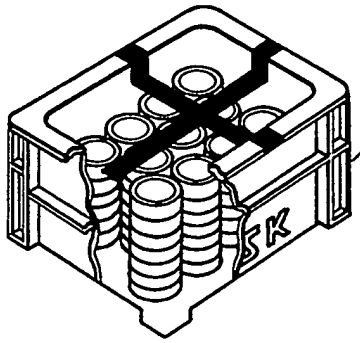
FIG. 5

PROCESS INSTRUCTION TABLE
73

74a

ACCOMPDATING METHOD		WEIGHT	FIGURE OF BAGGAGE
11 (PRODUCTS) × 7 (LAYERS)		14.5kg	
WRAPPING MATERIAL		NUMBER	
CASE	TRAY AND GOODS DELIVERY BOX	1	
BAG	GAZETTE	1	
POST	B	1	
PAT	H	3	
TAPE		2	

74b



SPECIAL CONTROL ITEMS	
	BLUE TAPE SHOULD BE USED.
	IN BAGGAGE FOR "A1", TAPE SHOULD BE APPLIED IN A CROSS-SHAPED FORM.

FIG. 6

WRAPPING PROCESS INSTRUCTION

NAME NUMBER	DESTINATION	ISSUE	SECTION 22	ACKNOWLEDGEMENT	INSPECTION	DRAWING
HR30307C*A	Z	A1		AKIBA 89-03-25	ISHII 89-03-25	ISHIHARA 89-03-25

CONTROL ITEMS	PROCESS STANDARDS
NUMBER OF THE ACCOMODATED	77
NUMBER OF BOXES	40
AMOUNT PER PALLET	3080
DIVISION OF PALLET	
MARKING (A)	HR30307C
MARKING (B)	
RUSTPREVENTION OIL	NO UNEVENNESS
QUANTITY OF OIL INSIDE A TANK	NOT SMALLER THAN 1/2
TRAY AND GOODS DELIVERY BOX	NO WATER AND NO FOREGIN MATTER

71

INSPECTION PROCESS INSTRUCTION TABLE	NO.
B BODY INSPECTION	BTK10101
ASSEMBLY	ASS10101
COMPLETION INSPECTION	BKK10101
COMPLETION INSPECTION 1	AK110101
COMPLETION INSPECTION 2	AK210101

NUMBER OF PRODUCTS	4620	NUMBER OF PALLET 1	NUMBER OF BOXES 60
NUMBER OF PRODUCTS PER BOX	77		
DATE OF INSPECTION	03-29	END NUMBER 1	END NUMBER
DATE OF DELIVERY	04-25		
INSPECTION ROD NUMBER NAME NUMBER	A101 903096		

75 INTEGRATIVE WORK INSTRUCTION TABLE

72

ACCOMODATING METHOD		WEIGHT
11 (PRODUCTS) × 7 (LAYERS)		14.5kg
WRAPPING MATERIAL		NUMBER
CASE	TRAY AND GOODS DELIVERY BOX	1
BAG	GAZETTE	1
POST	B	1
PAT	H	3
TAPE		2

FIGURE OF BAGGAGE

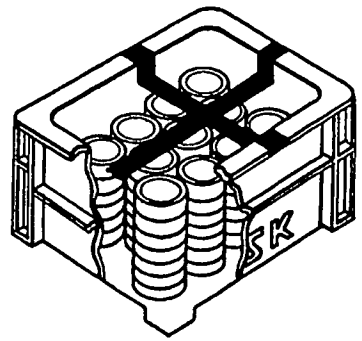


FIGURE OF BAGGAGE NO.

73

SPECIAL CONTROL ITEMS	
	BLUE TAPE SHOULD BE USED.
	IN BAGGAGE FOR "A1", TAPE SHOULD BE APPLIED IN A CROSS-SHAPED FORM.

PRODUCTION CONTROL INFORMATION PROCESSING SYSTEM

The present invention relates to a production control information processing system in which manufacturing drawings and instruction information, for example, with respect to quality control, production control, process control, and the like, which are required in the case of manufacturing products are properly integrated so that the most suitable instruction information for a production line is displayed.

As the production control information processing system of this kind as described above, conventionally, known is a production control system in which a character-type display is connected, as a terminal, to a host computer and character information is transferred between the host computer and the display so that various pieces of instruction information, for example, with respect to quality control, production control, process control, and the like, are transferred to a production line.

In the foregoing conventional production control information processing system, however, there has been a problem as follows. That is, various pieces of instruction information from the host computer are merely displayed in the terminal as character information, and various drawings such as manufacturing drawings, processing drawings, and the like, in a production line for products as well as a so-called

manually-formed "know how on spot", which is also called a working procedure, formed by a worker, an overseer, or a manager are separately instructed in the form of sheets of media. Accordingly, it is difficult to timely give instructions with such sheets of media to an actual spot in synchronism with a physical distribution and therefore the products do not accord with the instruction information to thereby give an influence on the quality guarantee.

The present invention has been therefore accomplished in view of the foregoing problem in the prior art and an object of the present invention is to provide a production control information processing system in which all the information such as manufacturing drawing data, various pieces of instruction information, a handwritten working procedure in a production line, and the like, are integrated with each other and the thus obtained integrative information is displayed in a display means provided in the production line in synchronism with a production process so that proper information transfer can be carried out to thereby make it possible to perform high-degree quality control.

In order to attain the foregoing object, the production control information processing system according to the present invention is characterized by comprising: a manufacturing drawing information generation means 100 for generating

manufacturing drawing information of products; a quality control information instruction means 200 for generating quality control instruction information on the basis of the manufacturing drawing information from the manufacturing drawing information generation means; a production control information generation means 300 for generating production control information including for example the number of products; a production integrative information generation means 400 supplied with the manufacturing drawing information from the manufacturing drawing information generation means, the quality control instruction information from the quality control information instruction means and the production control information from the production control information generation means for generating production integrative information further more adding process control instruction information 500 including image data to the quality control instruction information; and a production integrative information send-out means 600 for sending-out the production integrative information from the production integrative information generation means to an information output means 700 provided in a production line.

According to the present invention, manufacturing drawing information for desired products is generated in the manufacturing drawing information generation means, and quality control information such as control items, process standards, inspection work instructions, and the like for products in each

manufacturing process is generated, in the quality control information instruction means, on the basis of the manufacturing drawing information and in accordance with the process ability, the process setting, and the like of a factory. On the other hand, production control information such as the number of product orders received by customers, date of delivery of materials, and the like, is generated in the production control information generation means. Then, the manufacturing drawing information, the quality control information, and the production control information are sent to the production integrative information generation means, and process control instruction information including image data such as a working procedure which is a so-called "know how on spot" and the like are added to the supplied manufacturing drawing information, quality control information and production control information so that production integrative information is generated in the production integrative information generation means. Then, the production integrative information is sent to the information output means provided in the production line so that the most suitable instruction information corresponding to the product producing process is displayed or printed in the production line.

A particular embodiment in accordance with this invention will now be described with reference to the accompanying drawings, in which:-

Fig. 1 is a diagram schematically showing the fundamental configuration of the present invention;

Fig. 2 is a system diagram showing an embodiment of the present invention;

Fig. 3 is a diagram for explaining an example of the quality control instruction table;

Fig. 4 is a diagram for explaining an example of the manufacture instruction table;

Fig. 5 is a diagram for explaining an example of the process instruction table; and,

Fig. 6 is a diagram for explaining an example of the integrative work instruction table.

Next, an embodiment of the present invention will be described with reference to the accompanying drawings.

Fig. 2 is a block diagram showing an embodiment in which the present invention is applied to the case of manufacturing rolling bearings.

In the drawing, the reference numeral 1 designates a main information processing apparatus including, for example, a host computer provided in the head office of a manufacturing company, which is connected through a private high-speed digital communication line 2 to an engineering work station (hereinafter, refer red to as an EWS) 3 acting as the production integrative information generation means for integration-controlling a production line provided in a factory, and which is connected to a producing system computer

5 provided in the factory through a private high-speed digital communication line 4 in the same manner as the foregoing case, the producing system computer 5 being connected to the EWS 3 through an internal house line 6.

The main information processing apparatus 1 has a system portion 11 of computer aided design (CAD) acting as the manufacturing drawing information generation means, another system portion 12 of a computer aided quality-control (CAQ) acting as the quality control information instruction means, and a further system portion 13 of production control acting as the production control information generation means.

Upon reception of selection conditions of the rolling bearing, the computer aided design system portion 11 sets the form and arrangement of the bearing on the basis of the received selection conditions; determines the size of the bearing on the basis of the machine to be used, the designed life, the allowable static load coefficient, and the like; investigates special use conditions of the bearing, for example, such as the accuracy, the clearance, the holder, the lubrication condition, the use temperature, the atmosphere, and the like to thereby determine the bearing number (hereinafter, referred to as the "name number") of the bearing; searches a data base stored in advance on the basis of the name number to read figure drawing data of the bearing corresponding to the name number; and displays the data in a display device such as a CRT display or the like. Manufacturing drawing data for the

desired product can be generated by repetition of the foregoing operation and the thus generated manufacturing drawing data as well as the various conditions such as the selection conditions and the like are stored, as the manufacturing drawing information, into a manufacturing drawing control file 14.

The computer aided quality control system portion 12 reads the product number such as the name number or the like of the bearing determined in the computer aided design system portion 11 and stored in the manufacturing drawing control file 14; generates, based on the product number, a quality control instruction table 71 of Fig. 3 which contains process standards corresponding to control items such as the number of the accommodated, the number of boxes, the amount per pallet, and the like, required for quality control, and which further contains an inspection work instruction table; and stores the quality control instruction table 71 into a quality control file 15.

The production control system portion 13 is supplied with the ordered quantity from a customer, the date of delivery products stock status, user name, products cost, and the like, and stores the supplied data into a manufacture command file 16.

Further, the main information processing apparatus 1 has a data transmission/reception processing portion 17 and a data transmission portion 18. The data transmission/reception processing portion 17 is arranged so that it transmits the data

stored in the manufacturing drawing control file 14 and in the quality control file 15 to the EWS 3 when a transmission request is generated externally or internally, and receives manufacture history data from the EWS 3 and stores the data into a manufacture command file 19. The data transmission portion 18 is arranged to send the data stored in the manufacture command file 16 to the producing system computer 5.

The EWS 3 includes: a data transmission/reception processing portion 33 which receives various data sent from the main information processing apparatus 1 and the producing system computer 5, and analyzes the data received from the main information processing apparatus 1 and stores the analyzed data into a manufacturing drawing file 31 and an instruction file 32; an image scanner 34 for reading a handwritten guidance for respective steps including a package form and the like in accordance with "know how on spot" obtained, for example, from a QC (quality control) circle or the like; an image editing portion 35 for performing editing while displaying the image data read-in through the image scanner 34 and the instruction data stored in the instruction file 32 on a display device 38 to thereby generate, for example, a package process instruction table 73 as shown in Fig. 5; an image file 36 for storing the process instruction table 73 which has been edited in the image editing portion 35; and a data transmission/reception processing portion 37 acting as the production integrative information sending means which integrates the data stored in the files 31,

32, and 36 on the basis of a manufacture instruction table 72 sent from the producing system computer 5 and received in the data transmission/reception portion 33 and on the basis of a preceding process completion report to thereby generate an integrative work instruction table 75 of Fig. 6, and which transmits the thus generated integrative work instruction table 75 to corresponding interactive type intelligent terminals 61 and 62 provided in each producing process. Further, the reference numeral 39 designates a printer connected to the data transmission/reception processing portion 37 so as to print out the integrative work instruction table 75 in accordance with a requirement.

Supplied with the manufacture instruction table 72 from the main information processing apparatus 1, the producing system computer 5 generates a schedule on the basis of the table 72; issues a completion card on which a bar code acting as an identification code is printed by product; issues various slips for giving instructions for carrying out the schedule to a working spot, to a person in charge of a warehouse, to a person in charge of inspection, to a person in charge of transportation, and the like, on the basis of the schedule, the slips including, for example, a working slip for indicating a work, a delivery slip for indicating preparation of materials, jigs, or the like, an inspection slip for indicating inspection on intermediate or finished products and recording the result of inspection on the slip and a movement slip to be used in

movement and delivery of worked materials; sends the manufacture instruction table 72 to the EWS 3 through the communication line 6; and receives, through the EWS 3, feedback information which is the results of execution based on the slips.

Each of the interactive type intelligent terminals 61 and 62 includes a display device 64 such as a CRT display or the like for displaying integrative work instruction information outputted from the EWS 3, a processing device 65 with a keyboard for performing information transfer with the EWS 3 and for controlling display of the display device 64, and a bar code reader 66 for reading the bar code of a completion card which is moved with a product, so that the terminal displays predetermined guidance information for performing verification of each working slip in an entered production process and confirmation of the number of necessary working slips on the basis of the bar code of the completion card read by the bar code reader 66 and the identification number entered, for example, through the keyboard. When entry of predetermined items is normally performed on the basis of the guidance information, the integrative work instruction information stored in advance is displayed in the display device 64, and the identification code of the working process and data required for execution work are entered through the bar code reader 66 or the keyboard upon completion of the works so that the manufacture history such as the confirmation work,

the execution work, and the like is sent to the main information processing apparatus 1 through the EWS 3 and stored in the manufacture history file 19 of the apparatus 1.

Next, the operation of the above embodiment will be described about the bearing package process by way of example. First, the computer aided design system portion 11 of the main information processing apparatus 1 receives use conditions such as a radial load, an axial load, a rotational speed, and the like as well as bearing selection conditions, for example, size conditions such as a shaft diameter, a housing diameter, and the like; determines the form and arrangement of the bearing on the basis of the use conditions, the use environment, and the like; per forms predetermined application calculation corresponding to the form and arrangement of the bearing determined on the basis of the use conditions; determines the name number of the bearing in consideration of special use conditions such as accuracy of the bearing and the like; retrieves drawing data of the determined bearing name number from a data base to read the drawing data; and stores the drawing data together with various dimensional data, as the manufacturing drawing information, into the manufacturing drawing control file 14.

Next, the quality control system portion 12 forms the quality control instruction table in which process standards for preset control items are set on the basis of the determined bearing name number; forms the inspection work instruction

table; and stores both the instruction tables in the quality control file 15 as the quality control instruction table. Here, in the case of using package of the bearing as an example, the relation between the control items and the process standards is set as follows. That is, as shown in Fig. 3, the number of the accommodated is set to "77"; the number of boxes, "40"; the amount per palette, "3080"; the palette classification, "0 0 0"; the outer-rim side marking (A),"HR30307C"; the inner-rim side marking, "NON"; the rust prevention oil, "no unevenness in adhesion"; the quantity of oil inside a tank, "not smaller than 1/2": the tray and goods-delivery box, "no water and no foreign matter"; and so on.

Thus, the manufacturing drawing information and quality control instruction table corresponding to the product are stored in the manufacturing drawing control file 14 and the quality control file 15 respectively so as to be utilized as the data base.

Then, the thus formed manufacturing drawing information and quality control instruction table are sent to the EWS 3 through the data transmission portion 17 and the high-speed digital communication line 2 and respectively stored in the manufacturing drawing file 31 and the instruction file 32 through the data transmission portion 33.

Upon reception of the quantity of received order, the data of delivery, and the like, of the product in this state, the production control system portion 13 of the main

information processing apparatus 1 forms manufacturing commands such as the product code, the quantity of received order, the data of delivery, and the like; stores the manufacturing commands in the manufacturing command file 16; and sends the manufacturing commands to the producing system computer 5 provided in a factory through the data transmission portion 18 and the high-speed digital communication line 4.

Upon reception of the manufacture command, the producing system computer 5 stores the command in an internal memory; forms the manufacture instruction table 72 in which the number of products, the number of pallets, the number of boxes, the number of products per box, the fraction, the inspection date, the take-in date, the inspection lot number, and the name number for drawing parts are recorded on the basis of the manufacture command; transmits the manufacture instruction table 72 to the EWS 3 through the internal house line 6; and issues a completion card to be added to the product and various work slips.

Upon reception of the quality control instruction table 71, the EWS 3 stores the quality control instruction table into the instruction file 32 and makes a display device 38 display the quality control instruction table. On the basis of the display, an operator uses the image scanner 34 to reads in a handwritten guidance of Fig. 5 in which characters 74a and pictures 74b for each process such as a package form or the like in accordance with "know how on spot" obtained in a QC

circle in the factory; incorporates the read image data into a predetermined region of the process instruction table 75 so as to complete the process instruction table 73; and stores the thus completed process instruction table 73 in the image storage file 36. Next, the operator searches the instruction file 32 and the image storage file 36 on the basis of the name number by using the data transmission/reception processing portion 37; forms the integrative work instruction table 75 for instructing manufacture on the spot as shown in Fig. 6; transmits the integrative work instruction table 75 to the intelligent terminals 61 and 62 on the corresponding spot; stores the integrative work instruction table 75 in a built-in memory and a hard disk of each of the terminals.

On the spot, when the corresponding product is delivered from the preceding process, first, an identification code of a worker is entered, for example, through a ten-key, and the bar code of a completion card added to the product is entered through the bar code reader. By this, predetermined guidance information for performing verification of various work slips in the producing process and for performing confirmation of the number of necessary work slips is displayed. When entry of predetermined items is normally performed on the basis of the guidance information, the integrative work instruction table 75 stored in advance is displayed on the display device 64, and upon completion of the work the identification code of the work process and data

required for carrying out the work are entered through the bar code reader 66 or the ten-key so that the manufacture history such as the confirmation work, the execution work, and the like are transmitted to the main information processing apparatus 1 through the EWS 3 so as to be stored in the manufacture history file 19 of the apparatus 1.

Thus, the manufacturing drawing information, quality control information, and production control information formed in the main information processing apparatus 1 are transmitted to the EWS 3 provided in a factory and image data of the handwritten instruction including "know how on spot" and the like are added to the foregoing information to thereby form the integrative work instruction table. Therefore, no error is generated in transfer, transmission or the like, of the work instruction table. Further, since verification of the completion card added to the product and the work slips as well as the confirmation of the number of the necessary work slips are performed on the basis of the guidance information on the spot so that the integrative work instruction table 74 is displayed, erroneous work due to disagreement between the product and instruction information thereof can be surely prevented from occurring to thereby make it possible to effectively perform quality guarantee. Moreover, a series of work for a worker in a spot is stored, as the manufacture history, in the manufacture history file 19 in the main information processing apparatus 1 and therefore the

progressive condition of the product can be clearly grasped. Furthermore, even if a trouble is unfortunately caused, a countermeasure can be performed rapidly by searching the manufacture history file 19.

Although the case where the computer aided design system, the quality control system, and the production control system are processed by means of the main information processing apparatus 1 has been described in the foregoing embodiment, those systems may be processed with processors provided separately from each other.

Further, although the case where the main information processing apparatus 1 and the EWS 3 are connected to each other through the high-speed digital communication line 2 has been described in the foregoing embodiment, the present invention is not limited to this. Alternatively, any other wire or wireless data communication system may be used.

Moreover, although the case where the intelligent terminals 61 and 62 are provided on the producing spot has been described in the foregoing embodiment, any other terminals may be used so long as those terminals are interactive type terminals including display devices or printers respectively.

Furthermore, although the case where the bar code reader 66 is provided in each of the intelligent terminal 61 and 62 has been described in the foregoing embodiment, any other information input means such as a card reader for reading

a magnetic card on which information is magnetically recorded, an IC card reader for reading an IC card, or the like, may be used in place of the bar code reader 66.

As described above, the production control information processing system according to the present invention comprises: a manufacturing drawing information generation means for generating manufacturing drawing information of products; a quality control information instruction means for generating quality control instruction information on the basis of the manufacturing drawing information from the manufacturing drawing information generation means; a production control information generation means for generating production control information including for example the number of products; a production integrative information generation means supplied with the manufacturing drawing information from the manufacturing drawing information generation means, the quality control instruction information from the quality control information instruction means and the production control information from the production control information generation means for generating production integrative information further more adding process control instruction information including image data to the quality control instruction information; and a production integrative information send-out means for sending-out the production integrative information from the production integrative information generation means to an information output means provided in a production line.

Accordingly, it is possible to obtain such effects that manufacturing information, selling information, and technique information can be timely referred to on the manufacturing spot and the process control instruction information including the handwritten instruction such as "know how on spot" or the like can be integrated, work instruction information suitable for the producing spot can be correctly transmitted and the progressive condition of a product can be properly grasped so that integrative control in the case of manufacturing the products can be efficiently performed.

C L A I M S

1. A production control information processing system comprising:

a manufacturing drawing information generation means for generating manufacturing drawing information of products;

a quality control information instruction means for generating quality control instruction information on the basis of the manufacturing drawing information . from said manufacturing drawing information generation means;

a production control information generation means for generating production control information including the number of products;

a production integrative information generation means supplied with the manufacturing drawing information from said manufacturing drawing information generation means, the quality control instruction information from said quality control information instruction means and the production control information from said production control information generation means for generating production integrative information further more adding process control instruction information including image data to the quality control instruction information; and

a production integrative information send-out means for sending-out the production integrative information from said production integrative information generation means to an information output means provided in a production line.

2. A production control information processing system according to claim 1, in which said manufacturing drawing information generation means comprises a computer aided design system portion for forming said manufacturing drawing information.

3. A production control information processing system according to claim 1, in which said quality control information instruction means comprises a computer aided quality control system portion for forming said quality control instruction information on the basis of said manufacturing drawing information.

4. A production control information processing system according to claim 1, in which said production control information generation means comprises a production control system portion for entering at least one of the number of products, the date of delivery, products stock status, user name and products cost and for forming said production control information.

5. A production control information processing system according to claim 1, in which said production integrative information generation means comprises an engineering work station (EWS) to which each said information is transmitted and then in which a process instruction information having a

factory know how information, said manufacturing drawing information, said quality control instruction information, said production control information are integrated so as to form said production integrative information.

6. A production control information processing system substantially as described with reference to the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number
GB 9218358.1

Relevant Technical fields

(i) UK Cl (Edition K) G4A (AUB,AUXX)

(ii) Int Cl (Edition 5) G06F 15/46

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

Search Examiner
B G WESTERN

Date of Search
26 OCTOBER 1992

Documents considered relevant following a search in respect of claims 1-6

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	US 4149246 A (GOLDMAN) whole document	---
A	US 4827423 A (BEASLEY ET AL) whole document	---

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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